

IN THE SPECIFICATION:

Please amend the specification as follows:

Please replace the paragraph beginning at page 1, line 4 with the following rewritten paragraph.

TECHNICAL FIELD OF THE INVENTION

Please replace the paragraphs beginning at page 2, line 6 with the following rewritten paragraphs.

The present invention is made by taking the matters mentioned above into consideration, and an object of the present invention is to provide a gasket for a fuel battery which is provided with a function capable of performing an operation of specifying a cell or a module generating a voltage drop or a current reduction without disassembling disassembling a stack for a fuel battery, by directly measuring a voltage or a current of the cell or the module by a print circuit being electrically in contact with a separator, and a function of taking out an output of a gas sensor or a temperature sensor build built in the cell or the module.

DISCLOSURE SUMMARY OF THE INVENTION

Please replace the paragraphs beginning at page 3, line 23 through page 4, line 7 with the following rewritten paragraphs.

Further, in accordance with a fifth aspect of the present invention, there is provided a gasket for a fuel battery characterized in that a detecting portion having a function of taking out an output of a gas sensor ~~build~~ built in a cell or a module is integrally assembled.

Further, in accordance with a sixth aspect of the present invention, there is provided a gasket for a fuel battery characterized in that a detecting portion having a function of taking out an output of a temperature sensor ~~build~~ built in a cell or a module is integrally assembled.

Please replace the paragraph beginning at page 7, line 3 through page 9 with the following rewritten paragraph.

(2) Further, the substrate is made of a heat-resistant resin sheet such as a polyimide (PI), a polyether nitrile (PEN), a polyethylene terephthalate (PET), an epoxy-based resin, a phenol-based resin or the like, and the circuit portion is formed by using a conductive ink, a copper, a nickel, a stainless steel, a titanium, a tungsten, a gold, a Permalloy, a Nichrome, an aluminum

foil or the like. In this case, the metal foil or the like such as the copper or the aluminum which is easily corroded by an electrolyte solution or the like can be covered by a metal having a corrosion resistance, an alloy thereof, a metallic compound or a coating material. Next, the gasket is arranged in the print circuit substrate so as to constitute the seal member. The arrangement is executed by a method of using an adhesive agent at a time of forming the gasket, a method of arranging on the basis of an adhesive property of the seal member itself, or a method of arranging after forming the seal member. In this case, the seal member is made of a saturated rubber such as a silicone rubber, a fluoro silicone rubber, an ethylene propylene rubber, a fluorine-contained rubber, a butyl rubber, a hydrogenation isoprene rubber, a hydrogenation butadiene rubber, a hydrogenation styrene butadiene rubber, a hydrogenation styrene isoprene rubber, an acrylic rubber, an ethylene acrylic rubber, a fluoro acrylic rubber, a styrene-based rubber, a hydrogenation styrene isoprene rubber and the like, or a liquid rubber thereof, a block type thermoplastic elastomer such as a styrene-butadiene styrene block copolymer, a styrene-isoprene styrene block copolymer and the like or a thermoplastic elastomer obtained by hydrogenating an unsaturated bonding portion thereof, a thermoplastic elastomer such as a polyester-base thermoplastic elastomer, an olefin-based elastomer and the like. In this case, when the seal member has an adhesive property to a

circuit board, it is possible to fix the gasket to the circuit board without using the adhesive agent, so that this structure is preferable. A self-adhesive gasket mentioned above can be satisfied by introducing a functional group, for example, a carboxyl group, a hydroxyl group, a ketone or an imide to a part of a chemical structure of the seal member or blending an adhesive agent component to the seal member. In this case, since the adhesive property has a preferable combination in correspondence to the natures of the seal member and the circuit board, it may be suitably selected. Further, a seal member which is selectively adhered only to the substrate without being adhered to a molding die, that is, a seal member having a selective adhesion property is more preferable. For example, a selective adhesive silicone rubber or the like can be listed ~~up~~. In this case, on the front surface of the circuit formed in the substrate, it is possible to cover all the front surface except a circuit portion or a terminal front end portion by a protecting member as occasion demands. The protecting member may be any material forming an insulative membrane, however, normally a material similar to the substrate or selected from materials having a good adhesive property with respect to the seal member is used. When using a polyethylene terephthalate having a small coefficient of permeability for the gas and the liquid, that is, having an excellent sealing property for the circuit board, and using a member having the same property as the polyethylene

terephthalate for the coating member, the substrate and the coating member are firmly bonded due to a thermo compression bonding, so that the electrolyte solution or the like is hard to permeate into the circuit portion, and in addition to a corrosion preventing effect in the circuit portion of the circuit board between the circuit board and the coating member, it is possible to expect an effect capable of preventing a warp due to a difference of thermal expansion between the substrate portion and the circuit portion. Further, the materials is not necessarily of same kind and different kinds of materials may be employed, as far as there is an affinity between the substrate material and the coating material.

Please replace the paragraph beginning at page 10, line 21 with the following rewritten paragraph.

(6) The fifth aspect mentioned above makes it possible to measure a concentration of a hydrogen supplied to the cell for the fuel battery from an external portion of the cell, by using a sensor for measuring the concentration.

Please replace the paragraph beginning at page 12, line 3 with the following rewritten paragraph.

(12) Further, in the case of using the cell seal obtained by forming the seal in the frame of the resin or the like, the structure is characterized that the signal line is arranged in the frame in accordance with a printing, an etching or the like and the seal is integrally formed in the frame in which the signal line and the resin frame are integrally formed, whereby even in the case of having the signal line, it is possible to secure the same space and assembling property as those of the seal having no signal line, and a cost increase can be restricted only ~~to that~~ for printing the signal line.

Please replace the paragraph beginning at page 12, line 21 through page 22, line 11 with the following rewritten paragraph.

(14) As an embodiment, a sheet in which a pressure sensitive heat sensitive adhesive agent (PSA: silicone based) is applied to the structure obtained by printing the carbon electrode and the signal line on the PET film and mold release paper is attached thereto is produced, and is punched in a frame shape by a punching mold, followed forming a selective adhesive silicone rubber (SHINETSU CHEMICAL CO., LTD: X-34-1277A/B) by a liquid injection molding machine. The product is called as a frame type (or carrier type) cell seal, is attached to the MEA in which the electrode is mounted to an ion exchange membrane after peeling the

mold release paper in the frame type seal and is thereafter mounted by applying a heat and a pressure. In the case of assembling in the cell, it is possible to monitor a current application state of the GDL by assembling so as to align with the GDL.

Please replace the paragraph beginning at page 13, line 19 with the following rewritten paragraph.

(16) In accordance with the structure mentioned above, since the signal line is printed in the frame for the purpose of mounting the seal to the ion exchange membrane, the space is not expanded and a man ~~hour~~ hours for assembling can be reduced, so that it is possible to produce with only a cost increase corresponding to the signal line printing cost, in comparison with the cell seal having no signal line for the diagnosis monitor.

Please replace the paragraph beginning at page 15, line 5 with the following rewritten paragraph.

BEST MODE FOR CARRYING OUT THE INVENTION DETAILED
DESCRIPTION OF THE PREFERRED EMBODIMENT

Please replace the paragraph beginning at page 16, line 12 through page 17, line 9 with the following rewritten paragraph.

A substrate (frame) 7 is attached to a peripheral edge portion of the electrolyte membrane 4 in the reaction electrode portion 3 by means of an adhesion or the like, and gaskets (seal rubbers) 8 and 9 are fixed to both upper and lower sides of the substrate 7. The upper gasket 8 is closely attached to a lower surface of the upper separator 1 with a predetermined compression margin, and the lower gasket 9 is closely attached to an upper surface of the lower separator 2 with a predetermined compression margin, whereby both of the gaskets 8 and 9 seal between a pair of separators 1 and 2. In this case, both of the illustrated gaskets 8 and 9 are integrally formed with each other via a communication portion 7a provided in the substrate 7 so as to form a through hole shape, however. However, they may be separately provided in upper and lower portions without the communication portion 7a. The substrate 7 is formed with a heat-resistant resin sheet or the like made of a polyimide, a polyether nitrile, a polyethylene terephthalate, an epoxy-based resin, a phenol-based resin or the like, and the gaskets 8 and 9 are formed with a saturated rubber or the like such as a silicone rubber, a fluorine-contained rubber, an ethylene propylene rubber and the like.

Please replace the paragraph beginning at page 20, line 17 through page 21, line 9 with the following rewritten paragraph.

Fig. 6 shows an embodiment of an invention in accordance with the fifth aspect of the present application. The structure is made such that it is possible to measure from an external portion of the cell or the module on the basis of a similar structure to the embodiment mentioned above, by using a gas sensor (also called as a hydrogen sensor) 14 for measuring a concentration of a hydrogen supplied to the cell for the fuel battery mentioned above.

The gas sensor 14 is, for example, of a type of constructing a bridge of a palladium 16 on a alumina substrate 15 having a thickness of 0.25 mm and a size of 5 mm square and detecting a concentration of hydrogen due to a bridge voltage change caused by the hydrogen attached to the palladium 16, and a measurement terminal portion 12a protrudes outward via the flexible print circuit 12 so as to form a detecting portion 17. Reference numerals 18 and 19 respectively denote a PI film.

Please replace the paragraph beginning at page 23, line 15 with the following rewritten paragraph.

Each of the cell seals 34 is obtained by integrally forming a gasket (bead) 36 made of a rubber such as a selective adhesive silicone rubber or the like on one surface of a gasket substrate (frame) 35 made of a resin such as a PET film or the like and applying an adhesive agent 37 made of a PSA or the like on

another surface of the substrate 35, and is bonded to the peripheral edge portion 32a of the electrolyte membrane 32 by the adhesive agent 37. The gasket 36 is provided with an inner peripheral side gasket 36A and an outer peripheral side gasket 36B so as to be structured as an inner and outer double structure.

Please replace the paragraph beginning at page 24, line 18 through page 25, line 4 with the following rewritten paragraph.

That is, at first, in the gasket for the fuel battery in accordance with the first to fourth aspects of the present invention provided with the structure mentioned above, since the detecting portion for taking out the electric signal of the separator and the cell or the module in a state of combining a plurality of cells or modules so as to form the stack is integrally assembled in the gasket, it is possible to detect the electric signal only by connecting the tester to the detecting portion without disassembling disassembling the stack, whereby it is possible to easily know from the external portion which of the cells or modules the voltage drop or the current reduction is generated in.

Please replace the paragraphs beginning at page 25, line 16 through page 26 with the following rewritten paragraphs.

Further, in the gasket for the fuel battery in accordance with the seventh to ninth aspects of the present invention provided with the structure mentioned above, in addition to the same operations and effects as those of the gasket in accordance with the first to fourth aspects mentioned above, since the signal line is integrally formed with the substrate, an occupying space is not expanded so much in comparison with the structure having no signal line. Accordingly, it is possible to realize a space saving of the fuel batter and the seal portion thereof while providing with the detecting function mentioned above.

Further, in the gasket for the fuel battery in accordance with the tenth aspect of the present invention provided with the structure mentioned above, since the structure is made such that the front surface of the circuit formed on the substrate is covered by the protecting member constituted of by the insulative membrane, it is possible to obtain the effect of preventing the corrosion in the circuit portion, and the effect of preventing the warp due to the difference of thermal expansion between the substrate portion and the circuit portion.